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permitting another portion of said emanating light to be detected during said detecting step.

REMARKS

Reconsideration and allowance of the above-identified application are respectfully requested. Upon entry of this Amendment, claims 1-4, 7-18, and 21-51 will be pending.

The Examiner has rejected claims 1-3 and 15-17 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,563,070 to Yamamoto et al. The Examiner cites Yamamoto as disclosing an apparatus for examining a particle in a flow stream of a flow cytometer comprising a light emitting device comprising one incoherent light emitting semiconductor device adapted to emit light toward the flow stream, and a detector adapted to detect light emanating from the particle in response to emitted light striking the particle. Furthermore, the Examiner cites Yamamoto as disclosing an incoherent light emitting semiconductor device that is a light emitting diode, and in which the emanating light comprises fluorescent light and where the detector is adapted to detect fluorescent light.

Claim 1 as amended requires an apparatus for examining a particle and a flow stream of a flow cytometer comprising *a controller, adapted to control the light emitting device to emit the emitted light in pulses having a duty cycle less than about 10%*. Similarly independent claim 15 has been amended to require the step of controlling the light emitting device to emit the emitted light in pulses having a duty cycle less than about 10%. In order to anticipate a claim a prior art reference must contain each and every element recited in the claim. Because Yamamoto does not disclose a controller adapted to control the light emitting device to emit the emitted light in pulses, Yamamoto does not anticipate claims 1 or 15 of the present application. Therefore, the rejection under 35 U.S.C. 102 should be withdrawn. Furthermore, because claims 2 and 3 depend from claim 1 and because claims 16 and 17 depend from claim 15 the rejection of these dependent claims should be withdrawn as well.

The Examiner has rejected claims 4 and 18 under U.S.C. 103(a) as being unpatentable over Yamamoto in view of U.S. Patent No. 4,498,766 to Unterleitner. The Examiner cites Unterleitner as disclosing a flow cytometer with two exciting light sources which may be incoherent. However, in view of the amendment to claims 1 and 15 discussed above, claims 1 and 15 both now require emitting the light in pulses having a duty cycle less than about 10%. Because neither Yamamoto nor Unterleitner discloses this feature, the Examiner's rejection under 35 U.S.C. § 103(a) should be withdrawn.

The Examiner has rejected claims 5-10 and 19-24 under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto et al. in view of U.S. Patent No. 5,596,401 to Kusuzawa. Claims 5, 6, 19 and 20 have been canceled as dependent claims directed to limitations now incorporated into independent claims 1 and 15. However, the remaining claims 7-10 and 21-24 warrant reconsideration. The Examiner cites Kusuzawa as disclosing an apparatus for examining a particle on a flow stream of a flow cytometer including a controller adapted to control the light emitting device to emit light for a predetermined period during which the emitted light radiates on a particle. The Examiner further contends that Kusuzawa discloses the controller as being adapted to control the light-emitting device to emit light in pulses. Kusuzawa briefly refers to the use of a pulsed laser beam, but Kusuzawa does not disclose a controller adapted to control a light-emitting device to emit the emitted light in pulses having a duty cycle less than about 10%. Furthermore, there is no suggestion of a particular duty cycle in Kusuzawa. Controlling light-emitting device to emit the light in pulses having the duty cycle less than about 10% allows the light-emitting device to have a much longer life, while at the same time allowing the light-emitting device to be used at a much higher intensity during its short duty cycle.

Furthermore, the short duty cycle is advantageous in a flow cytometer having more than one light source and detectors to detect particular types of light, among other reasons. Therefore, because neither Yamamoto et al. nor Kusuzawa teach nor suggest all of the elements of amended claims 1 and 15, and because these limitations are incorporated into dependent claims 7-10 and 21-20, the Examiner's rejection should be withdrawn.

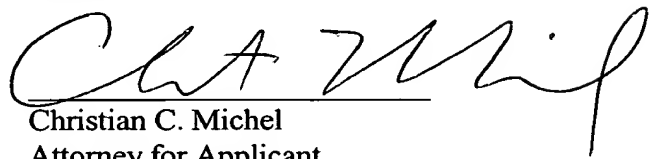
Finally, the Examiner rejects claims 11, 12, 14 and 25 under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto et al. in view of U.S. Patent No. 5,528,045 to Hoffman et al. The Examiner cites Hoffman as teaching a light obstructing device having a substantially opaque portion and two substantially transparent portions, which are placed before the detector so that the emanating light from each fluorochrome attached to the particle can be discriminated and detected separately. While Hoffman may show the features described by the Examiner, it does not make up for the deficiency of Yamamoto et al. described above. Namely, Hoffman does not teach nor suggest the light emitting device to emit light in pulses having the duty cycle less than about 10%. Because the combination of Yamamoto et al. and Hoffman does not teach or suggest all of the elements of independent claims 1 and 15, the Examiner's rejection of dependent claims 11, 12, 14 and 25 should be withdrawn.

Claim 21 was amended to correct a typo so that the dependency refers to the appropriate independent claim. New claims 26-51 have been added. New independent claim 26 represents former claim 13 rewritten in independent form since that claim was noted by the Examiner to be allowable if rewritten in independent form. New dependent claims 27-30 define the light-emitting semiconductor device as a light-emitting diode and further define the diode as emitting ultra violet light. New claims 31 through 42 recite an apparatus for examining a particle in a flow stream of a flow cytometer comprising a light emitting device comprising at least one light emitting diode adapted to emit light toward the flow stream, a detector adapted to detect light-emitting from the particle in response to the emitted light striking the particle, and a controller adapted to control the light-emitting diode to emit the light in pulses. New claims 43 through 51 are method claims corresponding to new apparatus claims 31 through 42. As discussed above, none of the cited references discuss or suggest an apparatus or method including a pulsed LED. Both independent claims 31 and 43 require a light-emitting diode to emit light impulses. Because none of the cited references teach or suggest this limitation, allowance of these claims is requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

In view of the above, it is believed that the application is in condition for allowance and notice to this effect is respectfully requested. Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claim 1 has been amended as follows:

1. (Amended) An apparatus for examining a particle in a flow stream of a flow cytometer, comprising:

a light-emitting device comprising at least one incoherent light-emitting semiconductor device, adapted to emit light toward said flow stream; [and]

a detector, adapted to detect light emanating from said particle in response to said emitted light striking said particle[.]; and

a controller, adapted to control said light emitting device to emit said emitted light in pulses having a duty cycle less than about 10%.

Claims 5, 6 and 13 have been canceled.

Claim 15 has been amended as follows:

15. A method for examining a particle in a flow stream of a flow cytometer, comprising:

activating a light emitting device to cause at least one incoherent light emitting semiconductor device to emit light toward said flow stream; [and]

detecting light emanating from said particle in response to said emitted light striking said particle[.]; and

controlling said light emitting device to emit said emitted light in pulses having a duty cycle less than about 10%.

Claims 19-20 have been canceled.

Claim 21 has been amended as follows:

21. A method as claimed in claim [1]15, further comprising:

activating a second light emitting device to emit a second substantially coherent light toward said flow stream.